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ABSTRACT

A study investigated the reading comprehension of 34 college freshmen in relation to the presence of 20 syntactic elements of written language in their expository writing. Language samples included one silent reading comprehension test that identified "high" and "low" readers and two expository in-class themes, one developed through classification, the other through comparison/contrast. The themes were subjected to syntactic analysis of 20 elements of written language chosen for their known contributions to syntactic maturity and their possible relationship to reading comprehension. Results of the application of a biserial correlation formula indicated that at least 10 elements of written language were significantly related to the students' reading comprehension scores. Good readers' writing was characterized by longer T-units expanded through such nonclausal structures as prepositional phrases, intra-T-unit coordinators, and passive verb phrases. Poor readers' writing was characterized by shorter T-units expanded primarily through the addition of subordinate clause structures. The low reading group also used more coordinated main clauses and run-on sentences than did the high reading group. These results support the notion that growth in one area of language is likely reflected to some extent in other areas as well. (Author/RL)

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The Reading-Writing Connection: An Analysis of the Written Language of University Freshmen at Two Reading Levels

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Paper presented at the Annual Meeting
of the National Reading Conference
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The Reading-Writing Connection: An Analysis of the Written Language of University Freshmen at Two Reading Levels

Teachers of reading and English frequently observe a relationship between the reading and writing skills of their students. The connection is sometimes articulated in the following manner: Most students who are bad readers are also bad writers. Some good readers are also bad writers. But generally speaking, the better readers are also the better writers.

Even though a connection is recognized, the relationship between reading and writing is still the subject of much speculation and research. Research designed to explore fundamental principles underlying language relationships is still in its infancy, and research implications for improved classroom instruction remain tentative at best (Athey, 1977).

Related Research

Since the early 1970's, several studies of reading-writing relationships have used language analysis strategies based upon the works of Kellogg Hunt (1965) and Francis Christensen (1968). Hunt introduced the concept of "syntactic maturity" which refers to the observed characteristics of syntax in oral or written language as individuals get older. Subsequent studies by Hunt (1970, 1977), Golub (1974), O'Donnell (1976, 1977), Loban (1976), and Stewart (1978) have isolated the criteria which appear to be the best indicators of syntactic maturity of written language. Several of the criteria involve the T-unit, defined by Hunt (1970) as "a single main clause plus whatever other subordinate clauses or nonclauses are attached to or imbedded within that one main clause" (p. 4). Mean T-unit length, mean clause length, and mean number of clauses per T-unit have been shown to be the most reliable

predictors of syntactic maturity of written language.

Christensen (1968) studied the concept of "mature writing style" and found that free final modification is a significant characteristic of professional writing and quality student writing. Free final modification refers to an unbound modifier which has been attached to but not embedded within the end of a sentence. Such unbound modifiers are set off by a mark of punctuation, the comma being the most common.

Some studies of elementary and secondary level reading-writing relationships have also isolated significant written language variables which predict reading success. These variables confirm reading and English teachers' belief that better readers almost always use more mature, complex structures in their writing. Evanechko, Ollila, and Armstrong (1974) studied the syntax of sixth graders' free writing and identified nine written language measures which consistently predicted reading success. Among these predictors were number of communication units (Loban, 1976) and the following structures: subordinate clauses, participles, paired conjunctions, comparatives, infinitives as subjects, appositives, and conjunctive adverbs. Johnson (1976) completed a similar study of fourth graders' language skills and concluded that number of words per T-unit was also an indicator of increased reading level. She found that the addition of words in free modification was a good indicator of reading competency among Caucasian children. A junior high school study by Kuntz (1975) revealed a strong correlation (.68) between reading scores and syntactic attainment scores. On a test of sentence combining skills, better readers were more able to produce complex structures such as gerund phrases and appositives than were poor readers.

A study by Fuller (1974) examined the syntax of university freshman writing in relation to general reading comprehension. Fuller found little

or no relationship between the reading comprehension and syntactic maturity of university freshmen's written summaries of a 20-minute film. However, her research design did not control several variables considered critical to written language analysis, including length of writing sample and day to day variation in writing quality. Research has shown that at least 400 words per written language sample are needed to provide reliable measures of syntactic maturity (O'Hare, 1973). Also, quality of written language may fluctuate significantly from day to day, especially among better writers (Kincaid, 1953).

Purpose

The purpose of the investigation reported here was to examine the relationship between general reading comprehension and twenty syntactic elements of written language produced by university freshmen at two reading levels, "high" and "low." Written language variables were chosen for their known contribution to syntactic maturity and their possible connection to reading comprehension.

In accomplishing the purpose of the study, the following questions were addressed:

1. Is the writing of good readers more syntactically mature than the writing of poor readers?
2. What syntactic elements characterize the writing of good readers?
3. What syntactic elements characterize the writing of poor readers?
4. How may one account for the relationship between reading comprehension and certain elements of written expression?

It should be noted that quality of written language was not a factor

under consideration in this investigation, though a number of studies appear to have found a positive correlation between syntactic maturity and quality theme writing (Crowhurst, 1980).

Method and Procedures

Seventy freshmen enrolled in beginning composition at a large southwestern university participated in the study. None had previously completed a university composition course. All students had been randomly assigned by computer to one of four composition sections.

Language samples consisted of one silent reading comprehension test (Nelson and Denny, 1973) and two expository in-class themes. "High" and "low" reading groups were identified based upon the comprehension subtest scores on Form C of the Nelson-Denny administered during the fourth week of the semester. The criteria for inclusion in the high reading group was a percentile score of 90 or better (grade level equivalent = 15+). For the low reading group, a percentile score of 28 or lower (grade level equivalent - -11.5) was the standard for inclusion. Each reading group contained 17 freshmen. A total of 34 freshmen, 18 men and 16 women, made up the final research sample.

During the first and third weeks of the semester, all 70 students wrote an in-class expository theme as part of their regular class requirements. All instructors gave uniform type-written directions to their students who in turn wrote for 50 minutes on each assignment. Theme number one was developed through classification: "Classify three types of television programs on TV today and tell why each is popular." Theme number two was developed through comparison/contrast: "Compare and contrast high school classes and college classes." Topic and mode of discourse were held constant for all students in order to control syntactic variations which might have occurred because of those variables (Perron, 1977). After the researcher xeroxed each theme, the

instructors graded and returned the papers to their students.

Once all reading and writing samples had been taken, students were informed of the research project by the researcher. Students were therefore not under the pressure of being studied as they completed their normal course requirements of beginning composition.

Writing samples were limited by counting to the end of the T-unit after the 225th word. A minimum of 450 words per student were subjected to syntactic analysis procedures during which the following twenty variables were located and tabulated: T-units, words per T-unit, T-units per sentence, clauses per T-unit, words per clause, subordinate clauses per T-unit, words per subordinate clause, words per main cluase, words per sentence, elliptical clauses, modals, "be" and "have" in the auxiliary, passive verbs, prepositional phrases, possessives, adverbs of time, gerunds and participles, intra-T-unit coordinators, inter-T-unit coordinators, and free final modifiers.

All students' written language was syntactically analyzed and described (Table 1), but only the scores of high and low readers were subjected to statistical comparisons.

Insert Table 1 about here

Statistical analysis consisted of the application of a biserial correlation formula to reading and writing raw scores. Biserial correlation coefficients indicated statistical differences between high and low reading groups on each of the 20 elements of syntax under study (Table 2). For example, a biserial coefficient of +.61 ($p < .001$) for prepositional phrases revealed that students in the high reading group produced a significantly greater number of prepositional phrases than did students in the low reading group.

Insert Table 2 about here

Results

Statistical results are reported here in relation to three of the four research questions which underlie the basic purpose of the study.

1. Is the writing of good readers more syntactically mature than the writing of poor readers?

The writing of good readers in this study appears to be more syntactically mature than that of poor readers. Application of the biserial correlation formula indicated that students in the high reading group produced significantly higher scores ($p < .05$) on nine elements of written language, while students in the low reading group scored significantly higher ($p < .05$) on only one written language variable. Significant positive correlation coefficients ranged from +.35 for words per subordinate clause to +.64 for intra-T-unit coordinators. One negative correlation, -.36 for number of T-units per sentence, was also statistically significant.

2. What syntactic elements characterize the writing of good readers?

High group readers used significantly more of the following nine elements of syntax than did low group readers:

1. Words per T-unit
2. Words per clause
3. Words per subordinate clause
4. Words per main clause
5. Number of passive verbs
6. Number of prepositional phrases
7. Number of gerunds and participles

8. Number of intra-T-unit coordinators

9. Number of free final modifiers

3. What syntactic elements characterize the writing of poor readers?

Low group readers used significantly more T-units per sentence than their high group peers. No other written language variables were statistically significant for poor readers.

Discussion

The reliability of number of words per T-unit as a good indicator of syntactic maturity has been demonstrated in major studies of language development (Hunt, 1965, 1970; O'Donnell, Griffin, and Norris, 1965; Loban, 1976; Stewart, 1978). In the present study, freshmen in the high reading group wrote significantly longer T-units ($\overline{M}$ = 16.68 words per T-unit) than their peers who were less competent readers. This finding supports Loban's (1976) research in which students in "high" language ability groups exhibited more mature writing and better reading skills than their classmates in the "low" language groups.

T-units may be lengthened in one of two ways: 1) by increasing the number of words per clause and 2) by increasing the number of subordinate clauses per T-unit. Both of these factors are considered to be further indicators of syntactic maturity. However, students in the high reading group demonstrated significantly higher scores only in mean words per clause. This finding supports Gebhard (1978) who found mean clause length to be an even better indicator of syntactic maturity than mean T-unit length. Hunt (1965) also noted a 36% increase in clause length between 12th graders and superior adult writers.

In general students in the high reading group were conservative in their use of subordinate clauses within T-units. In contrast low group students

used more, but not significantly more, subordinate clauses per T-unit. This observation supports Hunt's (1965) premise that T-unit expansion accomplished by increasing the incidence of subordinate clauses may have reached practical limits by grade 12. In fact, his superior adult writers used only a few more subordinate clauses than 12th grade writers. In the present study, low reading group students would often link three or four subordinate clauses within one T-unit, thus creating a winding, uncontrolled sentence such as the following:

> When I came to Stillwater it was only then
> that I realized that the high school educa-
> tion that followed was quite lacking which
> was a big disadvantage that can hurt in the
> end when I finally came to college where it's
> a lot harder than high school.

Over 90% of the above sentence is contained within subordinate clause structures, yet the relationships between subordinated ideas reflect unnecessary redundancy. Rosen (1969) points out that some young writers with inadequate control of language "spill out subordination awkwardly and inelegantly in the manner in which a younger child spills out coordination" (p. 16). It is conceivable that low group students have not yet learned to be conservative in their use of subordinate clauses and to achieve T-unit expansion more discretely. Subordinate clauses should be studied more closely in terms of their contribution to T-unit expansion among college freshman writers.

How did high group readers write significantly longer T-units without increasing the incidence of subordinate clauses? Results of this study indicate that T-unit expansion was achieved, at least in part, through the use of prepositional phrases, coordinated structures, passive verb constructions, and free final modifiers.

Extensive use of prepositional phrases has been shown to be a mark of writing maturity as well as a characteristic of professional writing style (O'Donnell et al., 1965; Schmeling, 1969; Gebhard, 1978). Freshmen in the high reading group used two and one-half times more prepositional phrases per T-unit than low group freshmen. The present study did not analyze the function of the prepositional phrase within T-units. Future research could focus upon how prepositional phrases are used as the mature writer lengthens his/her T-units. Such investigations would have implications for the design of sentence combining strategies in which the prepositional phrase is used in a variety of ways to lengthen T-units.

The incidence of coordinate conjunctions within T-units also appears to increase as one becomes a more mature writer (Hunt, 1965; Christensen, 1968; O'Donnell et al., 1967). Intra-T-unit coordinators "connect words, phrases, or clauses of the same rank and usually of the same kind--noun and noun, adjective and adjective, phrase and phrase, clause and clause" (Pence and Emery, 1963, p. 127). In the present study, intra-T-unit coordinators revealed the strongest correlation coefficient (+.64). Coordination implies multiple use of words, phrases, or clauses to illustrate a point. The addition of detail through coordination was a major factor in T-unit expansion among high reading group freshmen. Further research is needed to determine if sentence combining strategies which utilize coordination of detail are useful in helping college freshmen write more mature T-units.

By virtue of verb phrase expansion, T-units are also lengthened. Use of passive voice was significantly higher among the better readers. Passive voice constructions are formed by expanding the main verb using some form of the auxiliary "be." Compared to elements of written language discussed thus far, passive constructions have been examined least in relation to

syntactic maturity. Hunt (1965) found that passive verbs are significantly correlated with clause length (.55 correlation of coefficient). Potter (1966) observed twice as many passives in good 10th grade papers as in poor papers. The present study reveals the high reading group using twice as many passives per T-unit as the low reading group. Passive voice appears to be an element deserving further study in determining the relationship between reading and writing skills.

The final element of syntax contributing to T-unit expansion in this study is the free final modifier. Free final modification has been observed to be a characteristic of not only highly-rated student writing but also professional writing style (Christensen, 1968; Nold and Freedman, 1977; Gebhard, 1978). An example from the high reading group illustrates this element of mature writing style:

> During the past two decades, the people
> of America have turned to their televisions
> for entertainment, choosing to absorb excite-
> ment passively rather than to participate
> in more strenuous activities.

The last 13 words of the above 29-word T-unit are contained within a free final modifier. Clearly, free final modification adds to T-unit length as well as to the amount of detail within a sentence.

Unbound modifiers in the final position are often begun with a verbal. High group writing was also characterized by significantly more verbals--gerunds and participles. In creating a gerund or participle, the writer often passes through subordination, eliminating words which could account for unnecessary redundancy. Conciseness of expression may be a direct result of proper verbal usage. Loban (1976) writes:

> In the history of the English language, the use of nonfinite verbal constructions /such as gerunds and participles/ has been increasing for the past five centuries. They are a way of simplifying, and they are forceful; they help to express and to subordinate thought effectively and directly (p. 69).

Loban's (1976) high language ability groups demonstrated an increased use of gerunds and participles in their written language. The findings of the present study also support the premise that better readers incorporate more gerunds and participles in their written language than do poor readers. Further research is needed in which students are trained to conceptualize verbs beyond traditional action functions. Such research would have implications for both composition teaching and reading and vocabulary development among students.

High reading group freshmen produced long T-units expanded through the use of "mature" syntactic structures. Low reading group freshmen, however, produced more T-units per sentence. Hunt (1965) has shown that the ratio of T-units to sentences declines as children get older. This phenomena is explained in part by the tendency of younger children to use either conjoined or run-on sentences--strings of T-units joined by ands, commas, or no punctuation. More T-units per sentence among low group readers typically meant a run-on sentence, such as the following:

> The show that I believe everyone knows about and has seen at least once is Saturday Night Live, but this is a program that is different than most comedy shows, and the reason it is

so popular is because the humor in the
program relates to the public and that
is why I like the show so much.

Research into the diagnostic value of computing number of T-units per sentence could be considered. Such a figure may be useful in predicting either uncontrolled, immature writing or sophisticated writing as is seen in the form of compound/complex sentences.

Summary

Themes written by freshmen in the high reading group appear to be more syntactically mature than those written by low reading group students. Statistical application of a biserial correlation formula revealed significant differences between the means of ten syntactic variables. Nine were significantly higher for the high reading group, one was significantly higher for the low reading group.

The writing of more competent readers was characterized by longer T-units expanded through the use of prepositional phrases, coordinated structures, passive verb phrases, and free final modification. Gerunds and participles also appeared more frequently in the writing of good readers.

The writing of less competent readers was characterized by shorter T-units which were expanded in part by increasing the incidence of subordinate clauses. The low reading group wrote significantly more T-units per sentence. This latter factor appeared to be a reflection of more run-on and/or conjoined sentences observed in the low group's papers.

Implications For Future Reading Research

The final research question asks the following:

4. How may one account for the relationship between reading comprehension and certain elements of

written expression?

Results of this investigation suggest that at least ten elements of syntax are related to reading comprehension. The establishment of such relationships, however, does not imply causation. We may not conclude that the acquisition of good reading skills will cause university freshmen to attain syntactic maturity in their written expression. What we do gain from the results are new directions for future research which examines the nature of language relationships observed here.

Syntactic maturity of written language exhibited by freshmen in the high reading group is likely a reflection of students' linguistic awareness of complex grammatical structures. Linguistic awareness is defined by Chomsky (1965) as an intuitive, internalized knowledge of language. Through this internalized knowledge of language, one is capable of expressing grammatical utterances and distinguishing between grammatical and ungrammatical utterances.

Improvement of linguistic awareness is a fundamental principle underlying the models approach to composition instruction (Myers, 1978). Modeling methodologies are based upon the premise that by studying and imitating good writing, students will begin to internalize "good standards of speech" (Richards, 1942). The effects of linguistic awareness on reading comprehension have also been researched. Repeated readings of the same passage in a text has been shown to improve word recognition and reading comprehension among disabled readers (Fleisher, Jenkins, and Pany, 1979; Samuels, 1979). Hence the familiar cliche "The more you read, the better you read" is indeed supported through research.

The following research questions may be asked in relation to linguistic awareness and the results of the present study:

What instructional strategies can be devised

to improve reading and/or writing skills by focusing on the nine significant syntactic elements identified in this study? Will imitating models of these nine elements result in greater linguistic awareness among poor freshman readers?

While syntactic control and linguistic awareness is evident in long T-units of good readers, poor readers' lack of syntactic control is evident in their use of significantly more T-units per sentence. The low reading group demonstrated a tendency to use run-on sentences and coordinated main clauses. These same readers often forgot and repeated words and phrases which had been written earlier in the T-unit. The redundancy inherent in poor readers' multiple use of subordinate clauses is possibly related to inadequate short-term memory. Redundancy in syntactic patterns has been shown to interfere with reading comprehension (Donaldson and Wales, 1970; Smith, 1974). Athey (1977) notes that "the redundancy inherent in a simpler structure interferes in some way with comprehension, perhaps by taking up space in memory storage which could be used for additional information" (p. 85). Contrasting the structure of a relative subordinate clause with a more "mature" structure such as the participle phrase serves to illustrate Athey's point:

1. The man who is buying the car is my father.
2. The man buying the car is my father.

Replacing the relative clause "who is buying the car" with the participle phrase "buying the car" reduces redundancy which could interefere with reading comprehension.

The following questions then may be raised concerning the low reading group's tendency toward redundancy:

Will composition instruction which trains students to eliminate redundancy in their written language also improve the students' short term memory and reading comprehension?

Good readers' frequent use of gerunds and participles suggests their ability to conceptualize verbs beyond traditional action functions. Coleman (1965) found that nominalizations of active verbs has a significant effect on reading comprehension. For example, "Her consideration" is a more difficult structure to comprehend than "She considered." Good readers' use of significantly greater numbers of participles and gerunds is also a reflection of good expressive vocabularies. Two related research questions follow:

Will students trained to conceptualize verbs beyond the traditional action functions subsequently increase their reading and/or writing vocabulary? Will reading comprehension increase as a result of instruction in the use of gerunds and participles?

Good readers' increased use of passive verbs is also related to conceptualization tasks. To conceive that subjects receive action requires a certain amount of psychological distance on the part of the reader/writer. This stepping back and viewing experiences as a spectator rather than a doer "is basic to any adequate development of skills in transactional writing (writing to convey information to someone) and expressive poetic writing (writing to create a work of art)" (Britton, 1975, p. 4). Objectivity is also important to the development of critical reading skills. To evaluate critically a work of fiction requires the reader to distance himself/herself from the narrative. The research question that comes to mind is the following:

Does facility in use of passive verb phrases relate in any way to students' ability to be objective, critical readers?

The importance of predication in writing is the basis of the "Theory of the World Approach" to composition instruction (Myers, 1978). How students perceive their world is reflected in the verbs they choose to use when writing. Myers writes, "The student who says, 'I do not know what to say,' probably means 'I do not have a predicate for my noun or nouns'" (p. 41). The present study showed that both good and poor readers used about the same number of auxiliary verbs (modals and forms of "be" and "have"), thus illustrating that verb phrase expansion through the addition of auxiliaries is not necessarily related to reading competency. However, the complexity of the main verb was not studied. Nold and Freedman (1978) compiled a list of "common verbs" (i.e., do, find, give, keep, etc.) and found them to be characteristic of weak theme writing. Research extending the present study's findings should include analysis of sophistication in verb usage, active and passive. The following questions might be asked:

What kinds of verbs do good readers use compared to poor readers? How is verb use in written expression related to reading vocabulary? How might these findings be used to improve reading and writing skills?

Conclusion

Results of this investigation have supported and added to what educators currently know about reading-writing relationships. Though it was beyond the scope of this study to explain fully the reasons underlying the observed relationships, future researchers may now have a clearer conception of the range of possible connections between reading and writing.

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Table 1

Summary of 20 Syntactic Elements of Written Language Produced by 70 University Freshmen

Writing Variables	Mean Raw Score	Standard Deviation	Minimum	Maximum
T-units	30.01	4.780	21.00	44.00
Words/T-unit	15.94	2.561	10.63	22.04
T-units/sentence	1.10	.105	.78	1.50
Clauses/T-unit	1.49	.194	1.18	2.21
Words/clause	10.91	1.962	6.54	16.85
Subordinate clauses/T-unit	.48	.184	.18	.99
Words/subordinate clause	7.78	1.307	5.57	11.63
Words/main clause	13.05	2.331	8.34	18.25
Words/sentence	17.72	3.012	11.79	25.31
Elliptical clauses	1.47	1.099	0.00	5.00
Modals	7.17	3.476	1.00	16.00
"Be" and "have" in auxiliary	7.38	3.688	1.00	23.00
Passive verbs	3.32	2.739	0.00	13.00
Prepositional phrases	49.21	7.471	31.00	68.00
Possessives	6.17	3.234	1.00	16.00
Adverbs of time	1.81	1.516	0.00	6.00
Gerunds and participles	8.61	4.115	2.00	23.00
Intra-T-unit coordinators	12.98	4.101	3.00	24.00
Inter-T-unit coordinators	2.24	1.573	0.00	6.00
Free final modifiers	.24	.522	0.00	2.00

Mean Number of Words Analyzed = 470

Table 2

Results Of The Biserial Correlation Between

Silent Reading Comprehension and 20

Elements of Written Language

For High And Low

Reading Groups

Writing Variables	High Group Mean (N=17)	*S.D.*	Low Group Mean (N=17)	*S.D.*	R_b	*S.E.*
T-units	29.00	*4.782*	31.82	*5.714*	--.3287	*.1964*
Words/T-unit	16.68	*2.738*	15.03	*2.643*	.3723*	*.1912*
T-units/sentence	1.07	*.070*	1.13	*.125*	-.3600*	*.1927*
Clauses/T-unit	1.45	*.157*	1.52	*.226*	-.2895	*.2047*
Words/Clause	11.50	*1.797*	9.91	*1.946*	.4942**	*.1731*
Subordinate clauses/T-unit	.45	*.157*	.52	*.187*	-.2895	*.2059*
Words/subordinate clause	8.09	*1.694*	7.26	*1.129*	.3503*	*.1939*
Words/main clause	13.54	*2.334*	12.02	*2.334*	.3689*	*.1916*
Words/sentence	17.92	*2.681*	16.85	*2.723*	.2461	*.2046*
Elliptical clauses	1.70	*1.212*	1.17	*1.286*	.2633	*.2031*
Modals	7.88	*2.803*	7.58	*4.093*	.0533	*.2145*

Table 2 continued

"Be" and "have" in auxiliary	7.82	*2.811*	6.64	*5.011*	.1822	*.2092*
Passive verbs	5.29	*2.616*	2.82	*2.627*	.5394***	*.1650*
Prepositional phrases	53.47	*7.408*	45.17	*7.324*	.6197***	*.1491*
Possessives	5.70	*3.531*	6.29	*3.349*	-.1083	*.2129*
Adverbs of time	1.88	*1.615*	1.94	*.826*	-.0292	*.2148*
Gerunds and participles	10.58	*4.316*	6.58	*3.742*	.5612***	*.1609*
Intra-T-unit coordinators	14.17	*3.066*	10.11	*3.689*	.6481***	*.1429*
Inter-T-unit coordinators	1.94	*1.374*	2.52	*1.374*	-.2856	*.2062*
Free final modifiers	.64	*.701*	.11	*.332*	.5495***	*.1632*

*p < .05

**p < .01

***p < .001